

REMARKS

Claims 1-17 and 20-21 are currently pending in this application as amended. Claims 1, 6, and 14 have been amended to clarify the language of the claim. Support for the amendments can be found, for example, in the original drawings and in the original Specification at page 10, lines 1-21; at page 18, lines 8-14; and at page 19, lines 10-17. Accordingly, no new matter has been added by the amendments to the claims.

Claim Rejections Under 35 U.S.C. § 102(b)

Claims 1-13 and 20-21 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,096,048 (Howard). Applicants respectfully traverse the rejection and request that the rejection of claims 1-13 and 20-21 be withdrawn for at least the following reasons.

Claim 1, as amended, is directed to a fiducial marker holder apparatus having first and second arms and recites, *inter alia*,

a second marker attachment device disposed at a distal end of the second arm of the open-ended frame, the second marker attachment device having a plurality of marker attachment points that receive fiducial markers, at least a portion of the second marker attachment device being disposed at an angle with respect to a longitudinal axis of the second arm, the angled portion including at least one marker attachment point, at least two of the marker attachment points of the second marker attachment device being configured to receive fiducial markers in different orientations with respect to the second marker attachment device and each other.

[Emphasis added]

Similarly, claim 6, as amended, is directed to a fiducial marker holder apparatus having first and second arms and recites, *inter alia*,

an open-ended frame having first and second arms, the open-ended frame being configured to be removably attached to the maxillary holding device, the first arm having at least one marker attachment point that receives fiducial markers and the second arm having a plurality of marker attachment points that receive fiducial markers, at least two of the marker attachment points of the second arm being configured to

receive fiducial markers in different orientations with respect to the open-ended frame and each other, at least one of the first arm and the second arm having a first portion and a second portion extending at an angle from a longitudinal axis of the first portion, the second portion having at least one marker attachment point.

[Emphasis added]

Referring to Figs. 1-3, Howard discloses a skull fiducial marker system 1 having a U-shaped bar 3 tapering outwardly toward distal ends 9. Markers 11 are placed on the distal ends 9 through threaded openings 19. A number of holes 45 are formed in the distal ends 9 to reduce weight. A medial mounting portion 7 of the bar 3 receives mouthpiece 5 for fixing to the teeth of the patient. (col. 7, lines 22-55).

The Examiner proposes three separate interpretations of Howard in an attempt to meet the elements of claims 1 and 6: (i) that the “attachment portions” are disposed at a 180 degree angle to the arms; (ii) that the bores receiving the markers are disposed at a 90 degree angle relative the arms; and (iii) that the ends of “attachment portions” are “squared off,” which is disposed at an angle relative to the arms. (See Office Action, p. 4).

Applicants respectfully disagree with the Examiner’s characterizations of Howard and maintain that Howard does not show all of the claimed elements. Howard actually shows a U-shaped fiducial marker with markers attached on the sides of the straight, longitudinally extending arms. However, Applicants have amended the claims for the purpose of clarifying the language with respect to orientation.

With respect to the Examiner’s first interpretation of Howard, claim 1 has now been clarified to indicate that at least a portion of the second marker attachment device is disposed at an angle with respect to a longitudinal axis of the second arm. Further, claim 6 has been clarified to indicate that the second portion of the first or second arm extends from an angle from a longitudinal axis of the first portion. The marker system 1 of Howard clearly does not include any portion or attachment device disposed at an angle with respect to a longitudinal axis of the arm. As best shown in Fig. 2, the bar 3 is generally straight from the intermediary portion 7 to the distal end 9. The markers 11 all lie along the same axis defined by the distal end 9 and remainder of the arm. Conversely,

the fiducial marker system of the present application allows a user to place markers at different angles and orientations to form more complex framing patterns, rather than just a simple straight line. Howard therefore does not teach, suggest, or disclose at least a portion of a marker attachment device being disposed at an angle with respect to a longitudinal axis of the arm, or an arm having a first portion and a second portion disposed at angle with respect to a longitudinal axis of the first portion.

With respect to the Examiner's second interpretation of Howard, claim 1 calls for a portion of a marker attachment device disposed at an angle and a marker attachment point. Similarly, claim 6 calls for a portion of the arm extending at an angle and a marker attachment point. The Examiner's statement that the claims are anticipated because the threaded opening 19 of Howard is disposed at a 90 degree angle inherently characterizes the threaded opening 19 as the angled portion of the marker attachment device or the angled portion of the arm. However, this characterization is improper because it impermissibly reads an element out of the claim, *i.e.*, the marker attachment point. The threaded opening 19 corresponds at best to the marker attachment point, but the claims call for both an angled portion (of a marker attachment device or of the arm) and a marker attachment point. The threaded opening 19 cannot serve as both elements because the claims are structural in nature and as such each element is separate and distinct. Howard therefore does not teach, suggest, or disclose at least a portion of a marker attachment device being disposed at an angle with respect to a longitudinal axis of the arm, or an arm having a first portion and a second portion disposed at angle with respect to a longitudinal axis of the first portion.

With respect to the Examiner's third interpretation of Howard, claim 1 now calls for the angled portion of the second marker attachment device to include at least one marker attachment point. Similarly, claim 6 also now calls for the angled portion of the arm to include at least one marker attachment point. The "squared off" end of the distal marker end 9 clearly does not include a marker attachment point, nor would the thickness of the bar 3 at that location permit a marker attachment point to be added thereto. Howard therefore does not teach, suggest, or disclose the angled portion of a marker

attachment device having a marker attachment point, or an angled portion of an arm having a marker attachment point.

Accordingly, because Howard fails to disclose all of the elements of claims 1 and 6, Applicants respectfully request that the rejection of independent claims 1 and 6 under 35 U.S.C. § 102(b) be withdrawn.

Claims 2-5 and 20 are dependent upon claim 1. It is respectfully requested that the rejection of claims 2-5 and 20 based on Howard be withdrawn due at least to their dependence on claim 1.

Claims 7-13 and 21 are dependent upon claim 6. It is respectfully requested that the rejection of claims 7-13 and 21 based on Howard be withdrawn due at least to their dependence on claim 6.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 14-17 have been rejected under 35 U.S.C. § 103(a) as being obvious over Howard in view of U.S. Patent Application Publication No. 2003/0000535 (Galloway). Applicants respectfully traverse the rejection and request that the rejection of claims 14-17 be withdrawn for at least the following reasons.

Claim 14, as amended, is directed to a fiducial marker holder system having first and second arms and recites, *inter alia*,

an open-ended frame having first and second arms, the open-ended frame being configured to be removably attached to the maxillary holding device, the first arm having at least one marker attachment point that receives fiducial markers and the second arm having a plurality of marker attachment points that receive fiducial markers, at least two of the marker attachment points of the second arm being configured to receive fiducial markers in different orientations with respect to the open-ended frame and each other, at least one of the first arm and the second arm having a first portion and a second portion extending at an angle from a longitudinal axis of the first portion, the second portion having at least one marker attachment point.

[Emphasis added]

When combining two or more references to establish a *prima facie* case of obviousness, the references together must teach or suggest all of the claim limitations. M.P.E.P. § 2143.

As described above with respect to claim 6, Howard discloses a distal end 9 of a fiducial marker system 1 is straight, and therefore fails to disclose an arm having a first portion and a second portion having at least one marker attachment point and being disposed at an angle with respect to a longitudinal axis of the first portion and. (See, *e.g.*, Fig. 2). Galloway fails to compensate for the deficiency of Howard as a reference. Referring to Fig. 3, Galloway discloses a method and apparatus for performing image-guided surgery, including, for example, an ablative instrument 320, computer 305, reference emitter 330. (paragraph [0040]). However, Galloway only generally references fiducial markers and does not provide any detail regarding an apparatus for holding the fiducial markers. (See, *e.g.*, paragraph [0033]). Thus, Galloway does not teach an arm having a first portion and a second portion having at least one marker attachment point and being disposed at an angle with respect to a longitudinal axis of the first portion, because no structure of a fiducial marker system is described anywhere therein.

Claim 14 cannot be obvious under 35 U.S.C. § 103(a) in view of the combination of Howard and Galloway because the references together do not teach or suggest all of the claim limitations of claim 14. Therefore, it is respectfully requested that the rejection of claim 14 be withdrawn.

Claims 15-17 are dependent upon claim 14. It is respectfully requested that the rejection of claims 15-17 based upon obviousness over Howard in view of Galloway be withdrawn due at least to their dependence on claim 14.

CONCLUSION

In view of the foregoing Amendment and Remarks, it is respectfully submitted that the present application including claims 1-17 and 20-21, is in condition for allowance and such action is respectfully requested.

Respectfully submitted,

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